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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/676,315

10/01/2003

Keiji Hayashi

1324.68392

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7590

03/01/2007

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EXAMINER

PAYNE, SHARON E

ART UNIT

PAPER NUMBER

2875

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|----------------------------------------|-----------|---------------|
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3 MONTHS

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/676,315

Applicant(s)

HAYASHI ET AL.

Examiner

Sharon E. Payne

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The indicated allowability of claims 13 and 14 is withdrawn in view of the newly discovered reference(s) to a light guide within a reflector. Rejections based on the newly cited reference(s) follow. The Examiner regrets the inconvenience this action has caused.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farchmin et al. (U.S. Patent 5,567,042) in view of Takahashi et al. (JP 2000010095 A) and further in view of Japanese Unexamined Utility Model Application No. H05-59402 (hereinafter "Utility Model").

Regarding claim 9, Farchmin et al. discloses a light reflecting reflector (reference number 26), a plurality of cold-cathode tubes (reference numbers 28a-f) disposed inside the reflector (Fig. 4), wherein the reflector has a reflective surface that reflects the light having been emitted by the cold-cathode tubes in the direction nearly perpendicular to the wall of each tube, in the direction in which the light thus reflected does not re-enter the cold-cathode tubes (Fig. 5). Farchmin et al. does not disclose an optical waveguide or a reflector that only reflects light away from the light source.

Takahashi et al. discloses an optical waveguide connected with an open end of the reflector to guide the light emitted by the tubes (reference number 1, Fig. 1, English abstract).

The Utility Model discloses a reflector that has a reflective surface that reflects light only in a direction in which light thus reflected does not re-enter the cold-cathode tubes (Figs. 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the light guide of Takahashi et al. in the apparatus of Farchmin to make the light output more uniform. See the English abstract of Takahashi et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of the Utility Model in the apparatus of Farchmin to enhance light output by making more light come out of the reflector. See Figs. 1 and 2 of the Utility Model.

Concerning claim 10, Farchmin et al. discloses the reflective surface (reference number 50) being so disposed that the surface reflects the emitted light at an angle at which the reflected light runs through the space between the cold-cathode tube and the reflector adjacent thereto or between neighboring cold-cathode tubes (Fig. 5).

Regarding claim 11, Farchmin et al. discloses the reflective surface (reference number 50) being so disposed that the surface reflects the light emitted by one cold-cathode tube at an angle at which the reflected light runs through the space between the one cold-cathode tube and the other cold-cathode tube (Fig. 5) and that the surface reflects the light emitted by the other cold-cathode tube at an angle at which the reflected light runs through the space between the one cold-cathode tube and the wall surface of the reflector (Fig. 5, ray 60).

Concerning claim 12, Farchmin et al. discloses the reflective surface being composed of a plurality of curved segments (Figs. 3-5, reference numbers 54a-f).

Regarding claim 13, Farchmin et al. discloses a light reflecting reflector (reference number 26), a cold-cathode tube (reference numbers 28a) disposed inside the reflector (Fig. 4) Farchmin et al. does not disclose a first or second optical waveguide.

Takahashi et al. discloses a first optical waveguide connected with an open end of the reflector for guiding the light emitted by the cold cathode tube (reference number 1, Fig. 1, English abstract).

The Utility Model discloses a second optical waveguide (reference number 3, Fig. 1) disposed in a space between the cold-cathode tube and the reflector wherein a space is formed between the cold-cathode tube and the second optical waveguide (Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the light guide of Takahashi et al. in the apparatus of Farchmin to make the light output more uniform. See the English abstract of Takahashi et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of the Utility Model and make the end of the second optical

waveguide face the end of the first optical waveguide in the apparatus of Farchmin to enhance light output by making more light come out of the reflector. See Fig. 1 of the Utility Model.

Concerning claim 14, Farchmin et al. does not disclose a second optical waveguide. The Utility Model discloses the profile of the surface of the second optical waveguide that faces the outer surface of the tube being analogous to the profile of the outer surface of the tube (Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the configuration of the Utility Model in the apparatus of Farchmin to enhance light output by making more light come out of the reflector. See Figs. 1 and 2 of the Utility Model.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuki (JP 10-091079) in view of GB 2,092,823 (hereinafter "Matsushita"), and JP 09282918 A (hereinafter "Okahira").

Regarding claim 15, Kazuki discloses a light source (reference number 1) having a tube with a phosphor dispersed inside a wall of the tube (fluorescent tube, reference number 1), a housing (reference number 2) that houses the tube (Fig. 3) and has a reflector formed on an inner surface (Fig. 4), and a transparent filler (reference number 3) filled in the housing (Fig. 5), and an optical waveguide (reference number 4) guiding the light from the light source and emitting the light through a light emitting surface (Fig. 1A). Kazuki does not specifically disclose a cold cathode tube.

Matsushita discloses a light source having a fluorescent tube with a phosphor dispersed between opposing inner and outer diameters that form a wall of the tube (abstract).

Okahira discloses a cold cathode tube (English abstract)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the cold cathode fluorescent tube of Okahira in the apparatus Kazuki to lower the cost of the device. See the English abstract of Okahira.

It would have been obvious to one of ordinary skill in the art to use the configuration of Matsushita in the apparatus of Kazuki to make the lighting more consistent throughout the tube. See the abstract of Matsushita.

Regarding claim 16, Kazuki discloses a light source having a tube (reference number 1), a housing (reference number 2) that houses the tube (Figs. 3 and 4) and has a reflector (reference number 2) formed on an inner surface (Fig. 4), and a transparent filler (reference number 3) filled in the housing (Fig. 8B), an optical waveguide (reference number 4) guiding the light from the light source unit and emitting light through a light-emitting surface (Fig. 8B). Kazuki does not disclose a temperature sensor or a heating element.

Suzawa discloses a cold cathode tube (column 2, lines 25-30), temperature sensor for controlling the temperature of the cold-cathode tube (column 2, lines 25-30).

Okahira et al. discloses a heating element (reference number 46a) on the inner surface of the housing (Fig. 1) for heating the cold-cathode tube (reference number 12).

Putting the heating element on the same inner surface of the housing as is formed the reflector is considered to be an obvious variation. Since the heating element is well known in the art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to put the heating element on the same surface as the reflector to more efficiently heat the tube, since rearranging parts involves only routine skill in the art. See M.P.E.P. 2144.04.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the temperature sensor of Suzawa in the apparatus of Kazuki stabilize the temperature of the apparatus. See the abstract of Suzawa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the heating element of Okahira in the apparatus of Kazuki and Suzawa to "improve the lighting of a cold cathode fluorescent lamp at low temperature." See the English abstract of Okahira et al.

#### *Response to Arguments*

7. Applicant's arguments with respect to claims 9-16 have been considered but are moot in view of the new ground(s) of rejection.

#### *Conclusion*

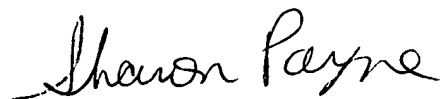
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharon E. Payne whose telephone number is (571) 272-2379. The examiner can normally be reached on regular business hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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